

## WE CLAIM:

1. A reflector for X-ray radiation, the reflector comprising:

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means defining a first non-circular arc shape along a first cross section, said first cross section extending in an XZ plane containing an X direction; and

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means defining a second non-circular arc shape along a second cross section, said second cross section extending in a YZ plane perpendicular to said X direction.

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2. The reflector of claim 1, wherein said second arc shape of the reflector along said second cross section defines focusing properties of the reflector.

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3. The reflector of claim 2, wherein said focusing properties are within said YZ plane.

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4. The reflector of claim 1, wherein said first and said second arc shapes focus or render parallel in two-dimensions.

5. The reflector of claim 1, wherein said first arc shape is parabolic, hyperbolic or elliptic along said first cross-section.

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6. The reflector of claim 1, further comprising a periodically repeating sequence of layers of materials A, B, ... with different refractive indices, wherein a sum  $d=d_A+d_B+\dots$  of thicknesses  $d_A$ ,  $d_B\dots$  of successive layers of said materials A, B,... changes continuously along said X-direction.

7. The reflector of claim 6, wherein said sum changes in monotonically.
- 5 8. The reflector of claim 7, wherein said sum changes along said second cross-section.
9. The reflector of claim 8, where said sum changes by more than 2%.
- 10 10. The reflector of claim 8, wherein a curvature of the reflector along said second cross-section compensates for a change in said sum d along said second cross-section by differing from a comparable reflector with a constant sum d and circular curvature along a respective second cross-section thereof for given focusing and reflectivity properties of the reflector.
- 15 11. The reflector of claim 1, wherein said second arc shape has an elliptical curvature of different lengths of semi-axes along said second cross-section.
- 20 12. The reflector of claim 1, wherein said second arc shape has a parabolic curvature along said second cross section.
- 25 13. The reflector of claim 1, wherein the reflector has a reflecting surface width of more than 2mm as measured perpendicular to said x-direction.
14. The reflector of claim 13, wherein said width is at least 4mm.

15. An X-ray analysis device comprising an X-ray source, an X-ray detector, optical shaping and/or delimiting means and the reflector of claim 1.
- 5 16. The X-ray analysis device of claim 15, wherein X-ray radiation impinges on the reflector at an angle of less than 5° with respect to said x-direction.
- 10 17. The X-ray analysis device of claim 15, wherein a curvature of the reflector along said second cross-section is formed such that a reflectivity of the reflector is maximum for a wavelength of radiation generated by said X-ray source.
- 15 18. The X-ray analysis device of claim 15, wherein said reflector focuses X-ray radiation impinging thereon to a focal spot.
19. The X-ray analysis device of claim 18, wherein said focal spot is on a sample or on said X-ray detector.
- 20 20. The X-ray analysis device of claim 15, wherein the reflector generates a reflected X-ray beam with a certain ray divergence from X-ray radiation impinging thereon.
- 25 21. The X-ray analysis device of claim 20, wherein said certain ray divergence generates parallel rays.